CLAIMS

WHAT IS CLAIMED IS:

1. A sliding member comprising a plurality of holes formed on a sliding surface thereof, which sliding surface is adapted to slide on a mating member, wherein

at least one of said holes has an enlarged portion in at least a portion between an opening end and a bottom end thereof, the enlarged portion being larger than the opening end on the sliding surface.

2. A sliding member according to claim 1, wherein the ratio of B/A is in the range between 1.2 and 4.0, in which the symbol "A" indicates the area of the opening end, and the symbol "B" indicates the area of the enlarged portion.

3. A sliding member according to claim 1, wherein the holes comprise:

at least one hole having the enlarged portion, of which the interior forms a cavity; and

at least one hole accommodating a solid lubricant therein.

4. A sliding member according to claim 2, wherein the holes comprise:

at least one hole having the enlarged portion, of which the interior forms a cavity; and

at least one hole accommodating a solid lubricant therein.

5. A sliding member according to claim 1, wherein the average diameter of the holes at the opening ends on the sliding surface is between 1 and 100 μm.

6. A sliding member according to claim 2, wherein the average diameter of the holes at the opening ends on the sliding surface is between 1 and 100 μm.

7. A sliding member according to claim 3, wherein the average diameter of the holes at the opening ends on the sliding surface is between 1 and 100 μm.

8. A sliding member according to claim 4, wherein the average diameter of the holes at the opening ends on the sliding surface is between 1 and 100 μm.

9. A sliding member according to claim 1, wherein the depths of the holes at deepest portions thereof are between 5 and 70 μm.

10. A sliding member according to claim 2, wherein the depths of the holes at deepest portions thereof are between 5 and 70 μm.

11. A sliding member according to claim 3, wherein the depths of the holes at deepest portions thereof are between 5 and 70 μm.

12. A sliding member according to claim 4, wherein the depths of the holes at deepest portions thereof are between 5 and 70 μm.

13. A sliding member according to claim 5, wherein the depths of the holes at deepest portions thereof are between 5 and 70 μm.

14. A sliding member according to claim 8, wherein the depths of the holes at deepest portions thereof are between 5 and 70 μm.

15. A method of manufacturing the sliding member according to claim 1, the sliding member comprising a cylindrical-shaped inner surface serving as a sliding surface, the method including the steps of:

bending a laser beam by means of a mirror provided on an optical axis of the laser beam;

condensing the laser beam by means of a condensing lens to irradiate the sliding surface; and

arranging the condensing lens so that a focus thereof is positioned on the sliding surface.

16. A method of manufacturing the sliding member according to claim 2, the sliding member comprising a cylindrical-shaped inner surface serving as a sliding surface, the method including the steps of:

bending a laser beam by means of a mirror provided on an optical axis of the laser beam;

condensing the laser beam by means of a condensing lens to irradiate the sliding surface; and

arranging the condensing lens so that a focus thereof is positioned on the sliding surface.

17. A method of manufacturing the sliding member according to claim 3, the sliding member comprising a cylindrical-shaped inner surface serving as a sliding surface, the method including the steps of:

bending a laser beam by means of a mirror provided on an optical axis of the laser beam;

condensing the laser beam by means of a condensing lens to irradiate the sliding surface; and

arranging the condensing lens so that a focus thereof is positioned on the sliding surface.

18. A method of manufacturing the sliding member according to claim 14, the sliding member comprising a cylindrical-shaped inner surface serving as a sliding surface, the method including the steps of:

bending a laser beam by means of a mirror provided on an optical axis of the laser beam;

condensing the laser beam by means of a condensing lens to irradiate the sliding surface; and

arranging the condensing lens so that a focus thereof is positioned on the sliding surface.

19. A method according to claim 15, wherein the power density of the laser beam is between 10^6 and 10^7 W/cm^2, and the laser beam is intermittently irradiated on the sliding surface with in pulse width of 10^{-6} to 10^{-3} sec to form the hole.

20. A method according to claim 18, wherein the power density of the laser beam is between 10^6 and 10^7 W/cm^2, and the laser beam is intermittently irradiated on the sliding surface with in pulse width of 10^{-6} to 10^{-3} sec to form the hole.